

## LIQUID CONTAINER

### RELATED APPLICATIONS

The present application is based on, and claims priority from, International Application No. PCT/JP2005/018335 filed October 4, 2005 and Japanese Application No. 2005-154066 filed May 26, 2005, the disclosures of which are hereby incorporated by reference herein in their entirety.

### FIELD OF THE INVENTION

The present invention relates to a liquid container for containing various liquids including beverages, such as a PET bottle.

### BACKGROUND OF THE INVENTION

Usually, beverages including refreshing drinks, carbonated drinks, teas and alcoholic drinks are contained in plastic liquid containers, such as PET bottles, when they are offered for sale. Such a liquid container is provided with a hollow container body capable of accommodating a drink and a neck extending from the top end of the container body, and a mouth is disposed at the top end of the neck.

When the drink is to be poured from this liquid container into a cup or a glass, the container body is held and inclined while the drink is being poured so that the mouth is positioned over the cup or the glass, but when the quantity of drink in the liquid container is large, the drink may splash out when the container body is inclined, resulting in a problem that the drink may be spilled out of the cup or the glass or be scattered around.

In this connection, there is a known drink container having a neck extending obliquely upward at the top of the container body and inclined in an inclining direction of the neck when the drink is poured, to facilitate pouring of the drink into the cup or the glass (see, for instance, Patent Document 1).

However, since such a drink container has a neck whose shape is inclined in advance as described above, the drink container cannot be held with the mouth of the neck oriented straight upward when the drink is not to be poured, inconvenience often occurs with the neck kept inclined. For instance, in a drink manufacturing plant, the drink cannot be poured into the container from a position immediately above the container. Accordingly there are substantial problems in filling such containers in existing plant facilities. Also, when such containers are displayed as merchandise in retail stores, unless their inclined necks are aligned with one another, the displayed state looks disorderly and deteriorates the looks of the store display.

Patent Document 1: Japanese Utility Model Registration No. 3107288

#### SUMMARY OF THE INVENTION

In view of the problems noted above, an object of the present invention is to provide a new and improved liquid container for permitting pouring of liquid with its mouth directed obliquely and also upright orientation of the mouth.

An aspect of the invention relates to a liquid container provided with a hollow container body capable of accommodating any desired liquid and a neck extending from the top of the container body, with a mouth for pouring liquid disposed at the top of the neck, wherein the liquid container includes a movable, i.e., flexible, part which can be inclined sideways, with the neck positioned above the flexible part in a prescribed position in the vertical position of the neck.

When liquid is poured into an external container, the structure enables the pouring to be done with the mouth of the liquid holding container directed toward the external container by inclining the neck in the upper part of the movable part sideways. Accordingly it is possible to reduce the problem of the liquid spilling out of the external container or scattering around it. Also, except when pouring liquid, the mouth of the liquid holding container can be kept right upward without inclining the neck.

Because the liquid container allows pouring of liquid with the mouth of the liquid container directed obliquely, pouring of the liquid into an external container is facilitated and the pouring of the liquid can be done smoothly. Also, as it is also possible to direct the mouth directly upward, it is possible, in a liquid dispensing plant, for instance, to pour the drink into the container from immediately above the container as is the case with ordinary liquid containers, thereby enabling the container to be used in existing plant facilities. In addition, when such containers are displayed as merchandise in retail stores, the container can be displayed in an orderly way, in the same way as ordinary liquid containers, by directing their neck directly upward, resulting in the advantage that the appearance of the store display is not deteriorated.

#### BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is an overall perspective view of a liquid container of an embodiment according to the present invention;

Figures 2(a) to 2(c) are front views of the liquid container of Fig. 1 under different circumstances;

Figure 3 is a front sectional view of the neck of the liquid container of Fig. 1, wherein the neck is pulled upward as in Fig. 2(a);

Figure 4 is a front sectional view of the neck of the liquid container of Fig. 1, wherein the neck is pressed downward as in Fig. 2(b);

Figure 5 is a front sectional view of the neck of the liquid container of Fig. 1, wherein the neck is inclined as in Fig. 2(c);

Figure 6 is a side view of the container of Fig. 1, as in Figs. 2(c) and 5, wherein liquid is being poured downwardly from the container into a glass;

Figure 7 is a side view of the container of Fig. 1, as in Figs. 2(c) and 5, wherein liquid is being poured from an upwardly inclined neck, thence downwardly into a container;

Figure 8 is a top view of another embodiment of a liquid container according to the invention;

Figure 9 is a front view of the neck and top of the liquid container of Fig. 8; and

Figure 10 is a front sectional view of the neck and top of the liquid container of Figs. 8 and 9.

#### DESCRIPTION OF SYMBOLS

1 ... container body; 2 ... neck; 2a ... lower neck portion; 2b ... upper neck portion; 3 ... flexible neck portion between neck portions 2a and 2b; 3a ... concave dimples between portions 2d and 3; 4 ... cap; 6 ... drink, 8 ... liquid.

#### DETAILED DESCRIPTION OF THE DRAWINGS

This liquid container of Figs. 1-7 includes a liquid container body 1 capable of containing a liquid, such as a beverage, a neck 2 extending upward from the upper end of the container body 1, a movable, i.e., flexible, part 3 disposed in a prescribed position in the vertical direction of neck 2. Container body 1, neck 2 and flexible part 3 are formed integrally by known blow molding techniques.

The container body 1 has a vertically long hollow shape having a longitudinal axis and a transverse section with a substantially rectangular shape. The size of body 1 matches a prescribed capacity (e.g. 1 liter, 1.5 liters, 2 liters and so forth).

The neck 2 comprises a lower neck portion 2a formed underneath the flexible part 3 and an upper neck portion 2b formed above the flexible part 3, and a mouth 2c disposed at the upper end of the upper neck portion 2b. The lower neck portion 2a is so formed that its transverse section constitutes a substantially rectangular shape, and its side faces extend obliquely upward as to approach one another from the upper end of the container body 1. The upper part 2d (Fig. 3) of lower neck portion 2a is so formed that its transverse section has a round shape and its diameter increases obliquely upward to form a structure similar to a fold of a bellows. The upper neck portion 2b is formed so that its transverse section has a round shape, and its circumferential shape is formed so that the diameter is greater in the substantially central part in the vertical direction and is smaller toward the upper end and the

lower end so as to form a structure similar to a bulb. A cap-shaped lid 4 is screwed onto threads of the upper end of upper neck portion 2b, and mouth 2c is opened and closed by lid 4.

The flexible part 3 is arranged between the lower neck portion 2a and upper neck portion 2b, and the upper neck portion 2b is deformable so as to be capable of being inclined in the transverse direction. The flexible part 3 has a flange shape extending in the radial direction of the neck 2, and the upper neck portion 2b is arranged inwardly in the radial direction. Thus, flexible part 3 extends outward in the radial direction from the lower end of the upper neck portion 2b to the upper part 2d of the lower neck portion 2a. The flange part of flexible part 3 can also be deformed in the vertical direction. In this case, flexible part 3 is formed so it can be deformed by being pulled upwardly as shown in Figure 2(a) and in a state in which its flange part is deformed downwardly as shown in Figure 2(b).

Thus, as shown in Figure 2(a) and Figure 3, when the upper neck portion 2b is pulled upwardly, the flexible part 3 is so deformed as to have an upward convex shape, and the neck 2 is stretched upwardly in the vertical direction. Also, as shown in Figure 2(b) and Figure 4, when the upper neck portion 2b is pressed downwardly, the flexible part 3 is deformed as to have a downward convex shape, and the neck 2 is contracted, i.e., compressed, in the vertical direction. Further, as shown in Figure 2(c) and Figure 5, when the upper neck portion 2b is inclined sideways, the flexible part 3 is deformed to have a downward convex shape on one end side in the widthwise direction (the inclining direction of the upper neck portion 2b) and the flexible part 3 is so deformed as to have an upward convex shape on the other side in the widthwise direction (the opposite side in the inclining direction of the upper neck portion 2b) to hold the upper neck portion 2b in the inclined state. In this case, the upper neck portion 2b can be inclined toward any side in the radial direction of the flexible part 3.

The liquid container configured as described above is to contain a beverage, such as tea, juice, alcoholic drink or the like. When a beverage 6 is poured from the container body into a glass 5 as shown in Figure 6, pouring of the beverage 6 into the glass 5 is facilitated

by inclining the container body 1 so the upper neck portion 2b is slanted, i.e., tilted relative to the longitudinal axis of body 1, toward the glass 5, resulting in a reduced risk of spilling the beverage 6 out of the glass 5 or having it scatter around the glass 5.

In this way, because the liquid container of Figs. 1-6 is provided with flexible, deformable part 3 that enables upper neck portion 2b to be inclined sideways, pouring of beverage 6 into glass 5 is facilitated by having the beverage 6 poured in a state wherein the upper neck portion 2b is slanted toward the glass 5, and the pouring of the liquid is enabled to be done smoothly. Also, as the upper neck portion 2b can be slanted as required, it is possible to keep the mouth 2c straight upward without inclining the upper neck portion 2b except when the beverage is to be poured. This makes it possible, in a liquid manufacturing plant for instance, to pour the beverage into the container from right above the container as is the case with ordinary liquid containers and accordingly there is the advantage of using existing plant facilities. Also, when such containers are displayed as merchandise in retail stores, the containers can be displayed in an orderly way as ordinary liquid containers are by upwardly directing their upper neck portion 2b, resulting in the further advantage that the appearance of the store display is not deteriorated.

Moreover, as flexible part 3 is formed as a flange extending in the radial direction from the lower end of the upper neck portion 2b positioned above it and the flange-shaped part is deformable in the vertical direction, the upper neck portion 2b can be inclined toward any side in the radial direction of flexible part 3. This enables the pouring of the beverage to be done easily without having to hold the container body 1 in a different way depending on the inclination direction of the upper neck portion 2b. In this case, since flexible part 3 expands in a flange shape toward underneath the mouth 2c, there is another advantage that drops of the beverage falling from the mouth 2c flow into flexible part 3 and the drops of the beverage can be prevented from flowing down to the container body 1.

Furthermore, when the upper neck portion 2b is inclined sideways in the state of being pressed downward, as a portion (on the opposite side in the inclining direction) of the flange-shaped part of flexible part 3 is deformed upward and the position of the liquid upper

surface 6a (Fig. 4) of the beverage 6 within relative to the mouth 2c is correspondingly lowered, even the quantity of the beverage 6 within container body 1 is large, the beverage 6 does not vigorously splash out when the container body 1 is inclined, and it is thereby easier to pour the beverage 6.

Also, as the flange-shaped part of flexible part 3 is bent in an upward deformed state and a downward deformed state, the inclined state of the upper neck portion 2b can be securely held.

Further, as the container body 1, the neck 2 and flexible part 3 are integrally formed, they can be fabricated in a similar fabricating method to ordinary containers, for instance by blow molding, and accordingly a significant advantage in practical application can be achieved.

Incidentally, though flexible part 3 is formed to have a flange as shown with respect to the embodiment described above, the flexible part 3 can have some other shape as appropriate, such as forming part of the neck 2 in a bellows shape. Also, though the transverse section of the container body 1 has a substantially rectangular shape in the embodiment described above, its transverse section can also be round. Further, the containers can be used for purposes other than holding drinks, such as PET bottles; for example, the containers can be used for other purposes including, for instance, beverage containers for household use and canteens. The containers can also be applied to what is intended for containing various non-beverage liquids, such as seasonings, oils, detergents and liquids for industrial use. In this case, when it is desired to pour the liquid little by little as in the case of a seasoning or the like, when a liquid 8 is to be poured into a container 7 as shown in Figure 7, if the upper neck portion 2b is slanted toward the direction opposite to the container 7 and the liquid 8 is discharged, the liquid 8 is not discharged in a large quantity at a time even if the container body 1 is slanted, but the liquid 8 can be poured securely little by little.

Figures 8 through 10 are illustrations of another embodiment of the container, wherein Figure 8 is a plan view of a liquid container; Figure 9 is a front view of the neck and

upper part thereof; and Figure 10 is a front sectional view of the neck and upper part thereof. The similar constituent parts as in the foregoing embodiment are designated by the same symbols.

In the embodiment of Figs. 8-10, the flexible part 3 is provided with a plurality of concave dimples 3a. Each of the concave dimples 3a is so arranged at intervals around the circumferential direction of the flexible part 3 as to be positioned on the periphery of the flange-shaped part. In this case, each of the concave dimples 3a is formed in the flexible part 3 so as to extend from the upper face of the flange-shaped part to the upper end part 2d of the lower neck portion 2a.

This causes, when the flange-shaped part of flexible part 3 is deformed in the vertical direction, stresses in the circumferential direction. The stresses on the periphery of the flange-shaped part are absorbed by the deformation of each of the concave dimples 3a in the circumferential direction, so that, even if the flexible part 3 is deformed repeatedly, no crack occurs in the periphery of the flange-shaped part, resulting in improvement in durability.